

**Remarks/Arguments:**

Claims 1-9 and 11-27 are pending and rejected in the application. No claims have been amended.

On page 2, the Official Action rejects claims 1-9, 11, 12 and 23-27 under 35 U.S.C. § 112, first paragraph. The Official Action states that the limitation of "calculating plural sets of transmitting symbol vectors" is not described in the specification in a way to enable one skilled in the art. In view of this rejection, Applicants' representatives contacted the Examiner for a telephone interview.

Applicants' representatives would like to thank the Examiner and Supervisor for the telephone interview on February 19, 2009. During the interview, the Examiner expressed the concern that the computation of singular value decomposition (SVD) in equation 2 of the specification is not described in enough detail. Specifically, the Examiner believed that the plurality of vectors  $V$  would be unique every time SVD is performed, and therefore would not be able to be decoded correctly by the receiver. Applicants' representatives explained the SVD is computed by setting a value ' $s$ ' as shown in equation 3 of the specification so that the receiving symbol has a specific power level. Applicants' invention is not concerned with the values of the transmitting vector  $V$  but the overall receiving power of the symbol. Thus, SVD is computed based on the desired power of the receiving symbol (' $s$ ' is chosen in the SVD to control the receiving power). This feature is at least supported in equation 3 and on page 25, line 26 of the specification ("*power of the receiving symbol 410a is virtually equal to the absolute value of  $s^2$* "). As a result of the interview, the Examiner and Examiner's Supervisor agreed to withdraw the 112 rejection.

On page 3, the Official Action rejects claim 13 under 35 U.S.C. § 102(e) as being anticipated by Ketchum. It is respectfully submitted, however, that the claims are patentable over the art of record for at least the reasons set forth below.

Applicants' invention, as recited in claim 13, includes a feature which is neither disclosed nor suggested by the art of record, namely:

**... the received signal being a signal including a transmitting symbol generated based on transmitting data and plural sets of transmitting symbols**

**calculated from the known symbol in the transmitting apparatus ...**

Claim 13 relates to plural sets of transmitting symbol vectors that are computed by the transmitting apparatus. Support for the plural sets of transmitting symbol vectors is at least found in Figs. 18A, 18B and pages 24 and 27 of the specification. No new matter has been added.

Ketchum suggests a standard MIMO system. Specifically, in paragraphs 20-30 Ketchum suggests performing singular value decomposition (SVD) where transmitting vectors are decomposed from a channel response matrix (*"with matrices  $V(k)$  and  $U(k)$  at the transmitter receiver, respectively, results in the overall orthogonalization of the multiple symbol streams at the receiver"*). Ketchum standard MIMO system, however, only calculates a single set of transmitting symbol vectors based on the channel response matrix (he does not calculate **plural sets** of transmitting symbol vectors).

Applicants' claim 13 is different than the art of record because of the plural sets of transmitting symbols (*"... the received signal being a signal including a transmitting symbol generated based on transmitting data and plural sets of transmitting symbols calculated from the known symbol in the transmitting apparatus ..."*). As shown in Applicants' Fig. 18A and 18B, there are two examples of calculating plural sets of transmitting symbol vectors. Specifically, in Fig. 18A, a two antenna system would have four possible transmitting symbol vectors. Similarly, in 18B, a three antenna system would have 8 transmitting symbol vectors. This is at least supported on page 27 of the specification (*"as shown in Fig. 18B, there are increasing the set pattern for the symbol selection vector  $C$  in proportion to the increase in the number of antennas ... calculate a plurality of pairs of complex symbols each symbol corresponding to the transmitting station antennas ... in order to control the power of the receiving symbol 410a in the receiving station"*). The plural sets of transmitting symbol vectors are computed as shown on page 26 of the specification where the transmission vector  $V$  is multiplied by a selection vector  $C1$  and  $C0$ . In the example on page 26, a two antenna system is realized. Accordingly, for the reasons set forth above, claim 13 is not subject to rejection as being anticipated by Ketchum. Withdrawal of the rejection and allowance of the claim is respectfully requested.

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Claims 14-22 are rejected in view of various combinations of Ketchum, Doberstein et al. (U.S. Patent No. 6,424,678), Subramanian (U.S. Patent No. 5,361,276) and Bruekers et al. (US 2002/0105907). Doberstein is directed to multi-carrier communication. Subramanian is directed to spread spectrum reception. Bruekers is directed to robust checksums. None of these references, however, make up for the deficiencies of Ketchum. Thus, neither Doberstein, Subramanian nor Bruekers suggests calculating plural sets of transmitting symbol vectors. Thus, the combination of these references with Ketchum is also deficient in suggesting the features of claim 13.

Claim 18 includes similar features to those of claim 13. Thus, claim 18 is also patentable over the art of record for at least the reasons set forth above.

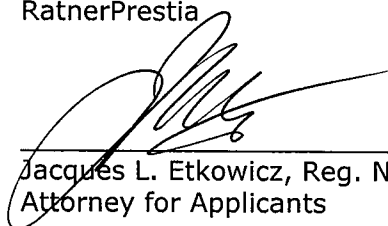
Applicants note that claims 1-9, 11-12 and 23-27 are not rejected in view of any prior art and thus allowable.

Dependent claims 14-17 and 19-22 include all the features of allowable claims 13 and 18, respectively. Thus, these claims are also patentable over the art of record for the reasons set forth above.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

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